DIFFERENTIATION OF THE ECONOMIC SPACE: MEASUREMENT, SIGNIFICANCE, CONSEQUENCES

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Abstract:

Socio-economic systems are developing unevenly. This unevenness can vary over a wide range. On the one hand, differentiation can be determined by natural fluctuations of socio-economic indicators. On the other hand, differentiation can be so significant that it blocks development. In the latter case, special measures of state policy are required to reduce it.

The objectives of the article are: to systematize the indicators and methods used to assess the level of social and economic differentiation; to assess the level of inequality and asymmetry in the modern economy; to propose measures to reduce the level of differentiation.

Materials and methods. Official data from international and national statistics were used. For its processing standard statistical and mathematical methods were applied; when formulating conclusions and proposals, the expert method, forecasting and modeling tools are used.

As a result of the research, the influence of differentiation of the economic space on the level and quality of life of the population is considered. The authors identified the positive and negative consequences of differentiation, described the indicators used for its measurement. An assessment of the unevenness of social and economic development at various levels of the hierarchy of socio-economic systems has been performed. As a result of the study, it was found that, in some cases, the uneven development not only does not decrease, but increases with time. This forms threats to the sustainability of development and blocks progress. The authors recommend more active use of special measures of state policy aimed at reducing the differentiation of the economic space.

Key words: economic space, regional differentiation, economic policy.

JEL classification: R12

INTRODUCTION

The modern world is facing new challenges of sustainable development. The end of the first decade of the 21st century was marked by a global crisis. After this crisis, the socio-economic development of countries and regions is turbulent. We see a high level of risks and volatility. This hampers economic growth and welfare. Because of economic problems, there are sharp political contradictions. As a result, there is a significant increase in the differentiation of countries and regions in terms of the level of social and economic development. The economic space (at the level of regions, countries, macro-regions and the world as a whole) becomes heterogeneous. As a result, existing problems become more acute and new ones arise. They are associated with the progress and development of mankind.

We came to the conclusion that one of the important problems of development is the differentiation of the economic space. What is differentiation? Differentiation of the economic

space is the measure of interregional differences in the general levels of economic development and living standards of the population. The problem is not that differentiation exists, but that it has a large value. The fact of the existence of differentiation is natural. Economic space can not be completely homogeneous. Differentiation of spatial development is peculiar to many countries and regions.

Studies that have been carried out in previous years in many countries of the world have shown the existence of dependence. There is a dependence: the greater the area of the country and the more diverse regions (by nature, culture, level of economic development, production volume, population, etc.), the differentiation is higher. A high level of differentiation becomes a problem. Attention to the problem of regional differentiation is due to the fact that it can negatively affect the socio-economic development. Excessive differentiation leads to a "rupture" of a single economic space.

Numerous studies have been devoted to the study of the problem of the high-level differentiation of the economic space (Aguilár and Ward, 2003; Archer, 1995; Fan et al, 2009; Gertler, 2010; Sanabria Gómez, 2017; Treshchevsky, 2013; Quah, 1996; and other). The authors of this article also paid attention to these issues in their earlier works (Plotnikov et al, 2015; Polozhentseva, 2016; Vertakova et al, 2015; Vertakova and Plotnikov, 2013; and other). In any case, the result of regional differentiation is socio-economic instability. It is necessary to take special measures of economic policy aimed at reducing regional differentiation.

The objectives of this article are: to systematize the indicators and methods used to assess the level of social and economic differentiation; to assess the level of inequality and asymmetry in the modern economy; to propose measures to reduce the level of differentiation.

MATERIALS AND METHODS

Authors used official data from international (Eurostat, Word Bank, UN, IMF and other) and national (Federal Service of State Statistics of the Russian Federation – Rosstat) statistics. For its processing standard statistical and mathematical methods were applied; when formulating conclusions and proposals, the expert method, forecasting and modeling tools are used too.

INDICATORS FOR ASSESSING DIFFERENTIATION

Differentiation can be assessed by various indicators that characterize the socio-economic development of a country or region. First of all, these are traditional indicators: GDP (GNP, national income) and national wealth. These indicators can be calculated as a whole, and in per capita terms. Also widely used is the estimate of the level of incomes of the population, the cost of living, the investment attractiveness of the territories, the accessibility of various benefits to the population, and so on. Economists have suggested using different special indices to measure the differentiation of economic development: The Human Development Index, Quality of life index, Health Development Index, Education Development Index, The Gini index, Prosperity Index and other.

Using special indexes complicates the evaluation procedure. On the other hand, these indices make it possible to make a comprehensive assessment. Therefore, they have become widespread in recent years. Popular among researchers are indicators that assess the level of socio-economic development, taking into account the environmental factor. These are different indices of the "green economy", the quality of the natural environment, environmental friendliness of production, "green GDP", etc. The application of this approach is based on the concept of sustainable development.

After selecting the indicators to evaluate and calculate their numerical values, we can make an estimate of the level of differentiation. For this, standard mathematical methods of grouping and statistical data processing are used. The simplest procedure for assessing the countries and regions in terms of the level of development is their ranking. The place in the rating allows you to assess the

place of the region (country) in question in their totality, and the dynamics of its change allows you to assess the effectiveness of public policy measures to reduce differentiation. Also, tools such as clustering, calculating deviations from the reference (normative) value, calculating variation and span of indicators, Gini coefficient and other special methods can be used to assess differentiation. The authors are sure that quantitative analysis of the size of differentiation is not enough. It also requires analysis using qualitative methods. It allows to identify the causes of differentiation, explain its nature, develop recommendations for its elimination, assess the effectiveness of regulatory measures taken.

EVALUATION DIFFERENTIATION OF THE ECONOMIC SPACE

Tables 1, 2, and 3 give data on some aspects of the socio-economic development of the countries of the world. Due to the large number of countries in the world and the limited volume of the article, we are only considering the top10 countries included in the respective ratings. Also, these tables include information about some of the major countries that have caused our research interest.

Analysis of the data given allows us to draw three conclusions. First, the differentiation of the countries of the world is high. Secondly, its level varies little over time. Thirdly, the leading countries in many respects are repeated in different ratings. This suggests that the causes of differentiation are complex. The level of differentiation is determined not only by economic, but also by social, cultural, historical and other prerequisites. To overcome the differentiation requires the implementation of comprehensive public policies and significant resources.

Table 1. Gini coefficient (income concentration) by countries

2012			2013			2014			2015		
Rank	Country	Value	Rank	Country	Value	Rank	Country	Value	Rank	Country	Value
1.	South Africa	62,4	1.	South Africa	65,0	1.	South Africa	64,5	1.	South Africa	63,4
2.	Republic of Haiti	60,79	2.	Bolivia	56,3	2.	Colombia	53,9	2.	Brazil	52,9
3.	Honduras	57,4	3.	Brazil	54,7	3.	Panama	51,67	3.	Chile	50,5
4	Colombia	53,54	4	Chile	52,1	4.	Brazil	51,48	4-5.	Mexico	48,1
5.	Brazil	52,67	5.	Nigeria	48,8	5.	Chile	51,3	4-5.	Bolivia	48,1
6.	Panama	51,9	6.	Argentina	44, 5	6.	Mexico	50,7	6.	Macedonia	44,1
7.	Costa Rica	48,61	7.	Congo	44,4	7.	Honduras	50,64	7-8.	Nigeria	43,0
8.	Paraguay	48,17	8.	Mexico	43,6	8.	Guatemala	48,66	7-8.	Philippines	43,0
9.	Mexico	48,07	9.	Macedonia	43,6	9.	Costa Rica	48,53	9.	Israel	42,8
10.	Bolivia	46,7	10.	Philippines	43,0	10.	Bolivia	48,4	10.	Angola	42,7
18.	China	42,16	12.	China	42,1	13.	China	46,9	12.	China	42,1
19.	Russia	42,0	13.	Russia	41,9	20.	Russia	41,6	14.	Russia	41,3
24.	USA	41,1	14.	USA	41,1	22.	USA	41,1	15.	the USA	41,1

Table 2. Human Development Index by countries

2013			2014			2015		
Rank	Country	Value	Rank	Country	Value	Rank	Country	Value
1.	Norway	0,955	1.	Norway	0,944	1.	Norway	0,944
2.	Australia	0,938	2.	Australia	0,933	2.	Australia	0,935
3.	USA	0,937	3.	Switzerland	0,917	3.	Switzerland	0,930
4.	Netherlands	0,921	4.	Netherlands	0,915	4.	Denmark	0,923
5.	Germany	0,92	5.	USA	0,914	5.	Netherlands	0,922
6.	New	0,919	6.	Germany	0,911	6-7.	Germany	0,916
7.	New Zealand	0,916	7.	New Zealand	0,910	6-7.	Ireland	0,916
8.	Ireland	0,916	8.	Canada	0,902	8.	USA	0,915
9.	Sweden	0,913	9.	Singapore	0,901	9-10.	Canada	0,913

10.	Switzerland	0,912	10.	Denmark	0,900	9-10.	New Zealand	0,913
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101.	Russia	0,699	57.	Russia	0,778	50.	Russia	0,798

Table 3. Quality of life index by countries

Rank	Country	2012	Country	2013	Country	2014	Country	2015
1.	Switzerland	194.11	Switzerland	215.71	Switzerland	206.23	Switzerland	222.94
2.	Germany	184.42	Germany	204.84	USA	195.55	Germany	195.94
3.	Norway	183.43	USA	199.56	Germany	192.69	Sweden	193.86
4.	United Arab Emirates	177.07	Sweden	191.36	Sweden	180.92	USA	192.49
5.	New Zealand	174.28	Canada	186.03	Finland	178.88	Finland	190.25
6.	Sweden	171.72	United Arab Emirates	186.01	Denmark	178.55	Denmark	190.18
7.	Canada	164.99	Denmark	182.29	Canada	178.29	Austria	182.62
8.	Denmark	163.12	Norway	173.86	Australia	175.98	Australia	180.81
9.	Australia	162.03	Qatar	169.92	United Arab Emirates	173.27	Canada	177.63
10.	Austria	159.89	Austria	167.39	Austria	171.82	New Zealand	175.51
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47.	Russia	-7,39	58. China	31,50	58. China	30,30	72. Russia	28,38
51.	China	-49,55	60. Russia	18,5	64. Russia	16,53	76. China	15,99

The problem of territories differentiation has always been inherent to many countries, especially in Russia, as a large country. In the Soviet Union, the problem of uneven development of the economic space was solved with the help of centralized financing of the economy and social sphere of the regions, planned pricing and a variety of social compensators. Despite this, at the end of the Soviet period (1988), the maximum gap between the Russian regions in terms of national income per capita was very significant and reached 11 times (the first place - Tyumen region, the last place - Agin Buryat Autonomous district).

Today, the gap between the regions in Russia remains at a high level. As shown in the Table 4, the differentiation between Russian's Federal districts is 4.17 times. Table 5 shows the change in the indicator of differentiation of Russian regions (the ratio of the maximum value of GRP per capita to the minimum) for the period 2010-2016. We see, that the differentiation of the Russian regions by the GRP per capita from 2014 was standing at about the same level. But this level is very, extremely high. The gap in indicators is much higher than it was in the Soviet period, it is also higher than in the developed countries of the world. This situation creates problems in development, is a source of socio-political tensions and economic instability.

Table 4. Differentiation of the Russia's Federal districts (2016)

Rank	Federal district	GRP per capita, rubles	Relation of the maximum value of GRP per capita to the minimum
1.	Ural Federal district	727 405,3	4,17
2.	Central Federal district	579 294,4	3,32
3.	Far Eastern Federal District	574 118,1	3,29
4.	The North-Western Federal district	488 528,2	2,80
5.	Siberian Federal district	349 370,3	2,00
6.	Privolzhsky Federal district	334 587,4	1,92
7.	Southern Federal district	279 429,0	1,60
8.	The North Caucasian Federal district	174 338,7	1,00

Table 5. Differentiation of the Russia's regions (subjects of the Federation)

Year	2010	2011	2012	2013	2014	2015	2016
Relation of the maximum value of GRP per capita to the minimum	20,3	61,6	47,3	44,0	55,5	53,7	56,1

Leaders in terms of GRP per capita in Russia are the northern regions: Nenets Autonomous District, Yamalo-Nenets Autonomous District, Khanty-Mansi Autonomous District – Yugra. The superiority of these regions due to the high concentration of enterprises for the extraction and primary processing of minerals (oil and gas). However, in the socio-economic sense, these are not the most prosperous regions, as they are characterized by the most severe climatic conditions, the highest cost of living, high investment costs, etc. The poorest are the republics of the North Caucasus. This is one of the reasons for social instability and terrorist activity in this macro-region.

The high degree of differentiation is not a specifically Russian phenomenon. For example, in the European Union countries, the difference between the most developed country (Luxembourg) and the least developed country (Bulgaria) is more than 5 times in relative terms. It is significant, but it is still much lower than the interregional differentiation in Russia.

The average level of development of the leading regions of the EU was estimated at 40–60 thousand Euros per capita. (The EU regional section has been reviewed in accordance with the NUTS 2 classification, the 2015 version.) GRP of the twenty richest regions of the EU (mainly located in Germany, the United Kingdom, Austria and the Netherlands) is at least 50% higher than the average GRP of the European Union as whole. The poorest regions of the EU are represented by Greece and the countries of Eastern Europe, especially Bulgaria, Hungary, and Romania (Table 6).

Table 6. Differentiation of the EU's regions (by NUTS 2 classification), GRP per capita, EUR thousand

Country	Region	2004	2008	2015
United Kingdom	West Inner London	113.9	135.2	167.5
Luxembourg	Luxembourg	53.6	67.6	76.2
Germany	Hamburg	49.5	53.9	59.5
Hungary	Northern Hungary	8.9	10.1	12.9
Romania	Northeast	5.2	7.9	9.9
Bulgaria	South Central Bulgaria	6.0	7.9	9.6

Table 7 shows the HDI index for EU. The differentiation between some countries is very large. We see a direct correlation between the level of GRP per capita and HDI index. The income and quality of life of the population depend on each other. Therefore, a high differentiation of the population in terms of incomes hinders the improvement of the quality of life.

Table 7. Human Development Index for EU countries

Rank in EU, 2015	Country	1990	2000	2010	2011	2012	2013	2014	2015
1	Germany	0.801	0.860	0.912	0.916	0.919	0.920	0.924	0.926
2	Denmark	0.799	0.862	0.910	0.922	0.924	0.926	0.923	0.925
3	Netherlands	0.830	0.878	0.911	0.921	0.922	0.923	0.923	0.924
4	Ireland	0.762	0.857	0.909	0.895	0.902	0.910	0.920	0.923
5	Sweden	0.815	0.877	0.901	0.903	0.904	0.906	0.909	0.913
6	Luxembourg	0.782	0.854	0.894	0.892	0.892	0.892	0.896	0.898
7	France	0.779	0.849	0.882	0.885	0.887	0.890	0.894	0.897
8	Belgium	0.805	0.873	0.884	0.886	0.889	0.890	0.895	0.896
9	Finland	0.783	0.856	0.878	0.884	0.887	0.890	0.893	0.895
10	Austria	0.794	0.837	0.880	0.884	0.887	0.892	0.892	0.893
11	Slovenia	0.767	0.824	0.876	0.877	0.878	0.888	0.888	0.890
12	Italy	0.768	0.828	0.872	0.877	0.876	0.877	0.881	0.887
13	Spain	0.755	0.825	0.867	0.871	0.874	0.877	0.882	0.884
14	Czech Republic	0.761	0.821	0.861	0.864	0.865	0.871	0.875	0.878
15	Greece	0.760	0.801	0.860	0.858	0.860	0.862	0.865	0.866
16	Estonia	0.728	0.781	0.838	0.850	0.856	0.860	0.863	0.865
17	Cyprus	0.733	0.800	0.847	0.850	0.849	0.850	0.854	0.856
18	Malta	0.736	0.783	0.826	0.821	0.828	0.847	0.853	0.856

Rank in EU, 2015	Country	1990	2000	2010	2011	2012	2013	2014	2015
19	Poland	0.712	0.784	0.829	0.834	0.838	0.850	0.852	0.855
20	Lithuania	0.731	0.757	0.826	0.830	0.834	0.841	0.846	0.848
21	Slovakia	0.738	0.763	0.829	0.835	0.838	0.841	0.842	0.845
22	Portugal	0.711	0.782	0.818	0.824	0.827	0.837	0.841	0.843
23	Hungary	0.703	0.769	0.821	0.823	0.824	0.834	0.834	0.836
24	Latvia	0.703	0.728	0.810	0.812	0.814	0.822	0.828	0.830
25	Croatia	0.669	0.749	0.808	0.815	0.817	0.820	0.823	0.827
26	Romania	0.700	0.708	0.798	0.797	0.794	0.797	0.798	0.802
27	Bulgaria	0.700	0.713	0.775	0.778	0.781	0.787	0.792	0.794

RECOMMENDATIONS TO REDUCE THE LEVEL OF DIFFERENTIATION

Differentiation has an ambiguous impact on development. On the one hand, it blocks it. On the other hand, socio-economic systems can not develop absolutely evenly. There are always disproportions in them. Overcoming these disparities is the driver of development. In addition, according to the theory of 'growth poles' François Perroux (1954), it is the uneven development of the territories that is the catalyst for the economic growth of the national economy. Table 8 shows the effects of economic differentiation on socio-economic development.

Table 8. The effects of economic differentiation on socio-economic development

Favorable effects	Unfavorable effects
• interregional economic inequality boosts most complete fulfillment of the potential of a particular region; • provides the possibility to enter into competition within the global economic system; • gives rise to highly developed regions with a great proportion of advanced industries and enterprises which become drivers to the growth of the country's economy and provide resources to support the lagging territories; • gives rise to clusters, areas of advanced development and special economic zones.	• wide wealth disparity among the population; • growing adjustments in the structure of the national economy; • emergence of struggling regions with a relatively low level of real incomes of the people, high unemployment, weak investment activity of the economic entities, insufficient fiscal capacity because of a low rate of self-sustainability of the region, etc. • redistribution of the federal financial resources (which are rather limited) to support the lagging regions.

If the level of differentiation is low, then, according to the authors, special measures should not be taken to overcome it. If it is high, an active policy is needed to reduce it. In Russia there is a second case. In this connection, we conducted an analysis of instruments of the regional policy for reducing the spatial differentiation:

- **Budget transfer.** Redistribution of funds (budget revenues) between budgets of different levels by means of inter-budget transfers
- **Territory administration.** Amalgamation, aggregation or disaggregation of territorial administrative units; integration of border areas
- **Investment.** Creation of favorable market environment to encourage investments in the lagging regions
- **Innovative.** Development of new industrial enterprises on the basis of the regional innovation programs
- **Fiscal.** Employment of the fiscal mechanisms for the purposes of regulation and reauthorization as to revenue budgeting
- **Cluster.** Development of the priority clusters and growth areas in the lagging regions to foster their economic advancement
- **Free economic areas.** Allocation and organization of free economic zones in the lagging regions by reference to its specifics
- **Infrastructure.** Exploitation of the unemployed comparative infrastructural advantages

of the region
- Resource. Exploitation of the spare "idle" resources and the resource-based competitive advantages of the region
- Institutional. Improvement of the regional business climate

The listed instruments of state policy should be applied in a comprehensive manner. This will increase the positive effect of their application. In addition, continuous monitoring of the situation is needed in order to monitor the results of state intervention in the socio-economic space. With the level of differentiation of spatial development that exists in Russia, one can not hope that market self-regulation will restore equilibrium in the development of regions. We have here a "market failure". To overcome it, active measures of the state are required.

CONCLUSION

Differentiation is one of the important problems of the development of regions, countries and the world as a whole. Despite some positive effects of differentiation, its growth leads to negative consequences. High differentiation blocks development.

Different indicators can be used to assess the level of differentiation. In this case, measurement using different indices yields close results. This means that uneven development is a complex problem. It is inherent in all socio-economic systems. This problem has special significance for Russia, as a large country with diverse regions.

To reduce the differentiation of territorial development requires the adoption of active measures by the state. This impact should be comprehensive. It relies on various instruments of state economic (regional) policy. The authors show the possibilities of using them.

The direction of further research is the development of a system for monitoring the effectiveness of measures aimed at reducing regional differentiation, as well as institutionalizing this monitoring.

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